REMARKS

By this Amendment, claims 2-33 have been amended and claim 34 has been added. Claims 1-34 are thus currently under examination in the present application. For the reasons set forth below, Applicants submit that the present amendments and arguments place this application in condition for immediate allowance.

As an initial matter, by the present amendments, claim 34 has been added to indicate that the modified aluminum oxides, which comprise certain of the supports of the presently-claimed compounds, can be selected from superacids of alumina and sulfated, sulfided, fluorinated, and chlorinated aluminum oxides. These particular features were previously presented in claim 14 of the application as filed and, accordingly, no new matter has been added by the addition of claim 34.

In the Office Action dated September 17, 2009, the Examiner first rejected claims 3-16, 18, 19, 22-31, and 33 under 35 U.S.C. §112, second paragraph, as being indefinite. Specifically, the Examiner asserted that the use of the terms "preferably" and "in particular" rendered certain of the claims indefinite because it was unclear whether the limitations that followed those terms were part of the claimed invention. Furthermore, the Examiner also asserted that certain of the claims were indefinite for reciting the use of a compound without setting forth any positive steps in the claimed method or process. Without addressing the merits of the Examiner's assertions, those rejections have now been rendered moot by virtue of the present amendments to the claims. In particular, by the present amendments, the claims have been amended to remove the terms "preferably" and "in particular" from claims 3,4, 6, 7, 9-11, 14-16, 18, 19, 22, 29, and 31, and have

also been amended to set forth certain steps in the methods recited in claims 26-33, as discussed further below. Accordingly, Applicants submit that the Examiner's rejections, insofar as applied to the claims as amended, are respectfully traversed and should be withdrawn.

In the Office Action, the Examiner then rejected claims 26-31 and 33 under 35 U.S.C. §101 for not setting forth any steps in the claimed methods. However, as indicated above, claims 26-33 have now been amended to appropriate method claims that include various positive steps. Support for these amendments can be found, for example, on pages 18-23 of the specification of the present application, as well as in claims 26-33 of the application, as filed. Accordingly, Applicants submit that claims 26-33, as amended, are in full compliance with the requirements of 35 U.S.C. §101 and that the Examiner's rejection is respectfully traversed and should be withdrawn.

In the Office Action, the Examiner further rejected claims 1-33 under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Vidal, et al. (U.S. Patent No. 6,229,060). In particular, the Examiner asserted that Vidal describes a compound that includes an alumina support onto which tungsten hydride is grafted and/or a compound that includes an alumina or silica support onto which tungsten hydride or tantalum hydride is grafted, and that, in light of those descriptions, one of ordinary skill in the art would find it obvious to select a specific combination of a support and metal in order to obtain a desired hydrocarbon by a metathesis reaction. For the reasons set forth below, Applicants submit that this rejection is respectfully traversed and should be withdrawn.

As reflected in the claims of the present application, the present invention is directed to a particular supported metallic compound that comprises a support based on aluminum oxide onto which tungsten hydride is grafted, as well as methods of using the supported metallic compounds as a catalyst in various chemical reactions. In contrast to the present application, Vidal only expressly discloses the grafting of tantalum or tungsten hydride onto silica (see, e.g., Examples 4 and 6), and does not specifically teach or suggest a compound that includes tungsten hydride grafted onto an alumina support. Indeed, there is no evidence in Vidal whatsoever that a specific compound including tungsten hydride grafted onto alumina has been generated, much less any teaching or suggestion that such a compound can or should be obtained. Instead, Vidal clearly indicates that supports comprised of silica should be used (see column 4, lines 4-6), and thus teaches away from the use of tungsten hydride-grafted alumina supports, such as those described and claimed in the present application. As such, Vidal in no way discloses a specific selection of tungsten hydride as a metal and a selection of alumina as a support onto which the tungsten hydride is grafted, and, accordingly, it thus the case that Vidal can not fairly be characterized as anticipating or rendering obvious the claims of the present application.

Furthermore, it is also the case that the compounds of the present application offer several surprising and unexpected advantages over other compounds that include various combinations of metals grafted onto supports. Indeed, as set forth in the Examples of the present application, a number of other metals were grafted onto various supports, including tungsten hydride onto a silica support (Example 4), tantalum hydride grafted

onto an alumina support (Example 5), and tantalum hydride grafted onto a silica support (Example 6), and were then compared to the compounds of the present invention. As shown in Table 1 and Example 7 of the present application, the compounds of the present invention, which include tungsten hydride grafted onto an alumina support, demonstrated a surprisingly higher catalytic activity in a propane metathesis reaction as compared to tantalum grafted onto silica or alumina, or tungsten grafted onto silica. Vidal certainly does not teach that such surprising and unexpected results can be obtained by using a tungsten hydride-grafted alumina support as, again, Vidal only expressly describes the use of tantalum or tungsten hydride grafted onto silica.

In summary, Vidal does not teach or suggest a compound that is comprised of the specific combination of tungsten hydride grafted onto an alumina support, and certainly does not teach or suggest the surprising and unexpected catalytic activity that is observed when such a compound is employed. Accordingly, Applicants respectfully submit that the claims of the present application, as amended, are not anticipated or rendered obvious by the cited Vidal reference, and thus further submit that the Examiner's rejections are respectfully traversed and should be withdrawn.

In the Office Action dated September 17, 2009, the Examiner also rejected claims 26-33 under 35 U.S.C. §103(a) as being unpatentable over Vidal in combination with either Vanoppen (U.S. Patent No. 7,220,888) or Basset (U.S. Patent No. 6,469,225). In particular, although the Examiner acknowledged that Vidal does not describe the use of a tungsten hydride-grafted alumina support in a process for preparing certain hydrocarbons or in manufacturing alkanes, the Examiner has asserted that it would be obvious to use

the catalyst of Vidal in the processes suggested in either Vanoppen or Basset. For the reasons set forth below, Applicants submit that this rejection is also respectfully traversed and should be withdrawn.

Contrary to the Examiner's assertions, the Vanoppen and Basset references still do not cure the deficiencies of Vidal. Vanoppen describes a process for the preparation of a hydrocarbon using a catalyst, and provides a list of hydride metals and a list of various supports onto which the metals can be grafted. However, Vanoppen only provides an example of the use of tantalum grafted onto silica as a catalyst in preparing hydrocarbons, and does not include any express teachings or suggestions regarding the use of tungsten hydride grafted onto an alumina support.

Similarly, Basset also describes the use of a catalyst in an alkane metathesis reaction, and provides a list of hydride metals as well as a list of supports onto which the metals can be grafted. However, and similar to the Vanoppen and Vidal references described above, Basset provides no teaching or suggestion that tungsten hydride grafted onto an alumina support can or should be used as a catalyst. Instead, like Vidal and Vanoppen, Basset teaches away from the use of a tungsten hydride-grafted support by expressly indicating that tantalum should be grafted onto silica.

Furthermore, it is also the case that neither the Vanoppen or Basset references, like the Vidal reference described above, teach or suggest the surprising and unexpected results that are achieved when a tungsten hydride-grafted alumina support is used as a catalyst. As mentioned above, Examples 4-7 of the present application are comparative examples that show that tungsten hydride-grafted alumina supports display an

unexpectedly higher catalytic activity when compared to tantalum-grafted alumina or silica supports or a tungsten-grafted silica support. None of the references cited by the Examiner in the present Office Action teach or suggest that such surprising and unexpected results can be achieved by using such a compound as those references clearly do not expressly describe the use of a catalytic compound that includes a specific combination of tungsten hydride grafted onto an alumina support.

Accordingly, Applicants respectfully submit that the present invention is not rendered obvious by the cited references and that the claims of the present application are clearly patentable over those references. Applicants thus submit that the Examiner's rejections on the basis of those references is respectfully traversed and should be withdrawn.

In light of the amendments and arguments provided herewith, Applicants submit that the present application overcomes all prior rejections and objections and has been placed in condition for allowance. Such action is respectfully requested.

Respectfully submitted,

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